Recommendations From

Nebraska Guidebook for Local Government
Multipurpose Land Information Systems

Geodetic Control – section IV

A. We recommend that new multipurpose GIS/LIS are based on NAD 83 and NAVD 88 from the beginning, thus avoiding some of the possible problems associated with transformations.

B. We recommend the use of the State Plane Coordinate System, NAD 83, as the basis for the recording of positions in local land-data systems in Nebraska. Selection of any other projection should be done reluctantly and only after most careful consideration.

C. We recommend that GIS/LIS systems developed with the goal of providing a multipurpose cadastre for local government use should be referenced to a local geodetic reference framework that is properly connected to the National Spatial Reference System (NSRS).

D. For all the nonfederal lands in Nebraska that are subdivided according to the Public Land Survey System (PLSS), we recommend that the geodetic reference framework for the cadastre be the section corners and the quarter-section corners of the PLSS, including the center point of each section. Each county (or municipality) that is planning to develop a GIS/LIS-based cadastre program should initiate a progressive program to relocate and monument these points according to the legally established procedures and properly connect them to the National Spatial Reference System to obtain geodetic coordinates.

Base Map – section V

E. To provide the foundational framework upon which the development a local government multipurpose land information system can be based, we recommend both a Public Land Survey System base map and a surface features base map. Both base maps should be tied to the National Spatial Reference System and have a level of spatial accuracy appropriate to the range of applications planned for a given area.

F. The following map scales and their corresponding National Horizontal Map Accuracy Standards are recommended guidelines for determining the positional accuracy needed for base maps in the development of a multipurpose local government GIS/LIS:

Relative Size of Property Parcels	Map Scale		Nat'l Horizontal Map Accuracy Std.	Equivalent Metric Scale
Urban areas	1:600	(1" = 50')	±1.7 ft.	1:500
	1:1,200	(1" = 100')	±3.3 ft.	1:1,000
Large urban and suburban	1:2,400	(1" = 200')	±6.7 ft.	1:2,500
Rural areas *	1:4,800	(1" = 400'	±13.3 ft.	1:5,000
	1:9,600	(1" = 800')	±26.7 ft.	1:10,000
	1:12,000	(1"= 1,000')	±33.3 ft.	1:10,000

G. In Nebraska, a PLSS base map data should be in the form of a digital database that includes all the original government (PLSS) corners, all restored survey marks representing those corners, and all county boundaries within a given area of coverage. Each government corner and monumented survey mark should be referenced in a related attribute database by a unique identifier and by the best available approximation of its coordinate location.

H. It is recommended that local governments considering the development of a multipurpose GIS/LIS, consult with the Nebraska State Surveyor's Office to explore the suitability of the Geographic Measurement Management approach for developing their PLSS base map. It is further recommended that local governments adopt the system of unique PLSS corner identification numbers developed by the U.S. Bureau of Land Management for this purpose.

I. It is recommended that a digital orthophoto be utilized as the surface features base map for a multipurpose GIS/LIS. A surface features base map provides the shapes and locational coordinates of major surface features such as roads, railroads, rivers, lakes, and other objects that might be seen from an airplane. In evaluating the adequacy of a given digital orthophoto to serve as a surface features base map, the spatial accuracy, resolution, and timeliness of a digital orthophoto should be compared to the requirements of planned and anticipated applications of the multipurpose GIS/LIS for a given.

Cadastral Data – section VI

J. In a GIS/LIS, the cadastral layer contains the boundaries of property ownership and other rights to land. Many of the applications that use the cadastral layer involve overlaying other layers such as soils, flood plains, or zoning to determine property parcel characteristics or relationships to certain conditions.   To support these types of applications, it is necessary to register accurately the spatial locations of various layers to each other. It is equally important to place the parcel boundaries in their accurate spatial locations and to portray their proper geometric shape as found in legal descriptions.

K. Two graphic data layers are necessary to provide the foundation for a wide variety of local government GIS/LIS applications. It is recommended, that at a minimum the cadastral data elements associated with: a) property parcels defined through legal government land subdivision and b) those associated with property parcels defined by land ownership patterns be captured as part of the graphic cadastral data layer(s). These graphic cadastral data elements include the locational coordinates for points representing parcel corners, topologically constructed lines between parcel corners representing parcel boundaries, and closed polygons representing the area included in a parcel.

L. A system of unique, permanent feature identification numbers is the key to linking specific graphic cadastral features to attribute information related to that particular graphic feature, which may be stored in separate databases. At a minimum, it is recommended that a system of permanent, unique feature identifiers be incorporated into the GIS/LIS for the land ownership parcel polygons, commonly known as Parcel Identification Numbers (PIN).

M. To provide the foundation necessary for a wide variety of local government applications, it is recommended that non-graphic, attribute data should be organized within the MPLIS which describes individual property parcels relative to their basic parcel characteristics, tenure, value, history, buildings and units within the parcel, and tax status. Much of this attribute data will already exist in separate databases within a variety of local agencies.